

CLAIMS

We claim:

1. An agricultural implement comprising:

a substantially rectangular center frame member having a front edge, a rear edge, and two side edges;

at least one substantially rectangular wing member, each wing member having a front edge, a rear edge, and two side edges;

a plurality of center frame member hinge plates mounted on the first of the side edges of the center frame member, wherein at least one of the center frame member hinge plates is proximate to the front edge of the center frame member, and further wherein, at least one of the center frame member hinge plates is proximate to the rear edge of the center frame member;

a plurality of wing member hinge plates mounted on one of the side edges of each wing member, wherein at least one of the wing member hinge plates is proximate to the front edge of each wing member, and further wherein, at least one of the wing member hinge plates is proximate to the rear edge of each wing member, and further wherein the plurality of center member hinge plates are configured to be pivotally connected to the plurality of wing member hinge plates so as to permit any of the wing members to be connected to the first of the side edges of the center member, and further wherein, once connected, the wing member is capable of being rotated between a first extended-working position substantially parallel to and outboard of the first of the side edges of the center frame member and a second folded-transport or storage position substantially above and perpendicular to the first of the side edges of the center frame member; and

a plurality of hitch connectors mounted to the agricultural implement and configured for connecting the agricultural implement to a suitable towing device.

2. The agricultural implement of claim 1 wherein at least one of the hitch connectors is located no more than 86.4 centimeters (34 inches) from the agricultural implement's center of mass.

3. The agricultural implement of claim 1 wherein the plurality of center member hinge plates and the plurality of wing member hinge plates are configured so as to permit a connected wing member when in the second folded-transport or storage position to be substantially inboard of the first of the side edges of the center frame member.
4. The agricultural implement of claim 1 further comprising:
a hinge pin wherein each of the plurality of center frame member hinge plates and each of the plurality of wing member hinge plates is configured to receive the hinge pin, and further wherein the hinge pin traverses substantially the distance of the first of the side edges of the center frame member and connects each of the plurality of center frame member hinge plates and each of the plurality of wing member hinge plates mounted to the first of the side edges of the center frame member and to one of the side edges of the connected wing member, respectively.
5. The agricultural implement of claim 4 wherein the hinge pin is a solid steel rod having a diameter of at least 5.1 centimeters (2 inches).
6. The agricultural implement of claim 1 further comprising a plurality of hydraulic cylinders capable of accomplishing the rotation of a wing member connected to the first of the side edges of the center frame member, wherein at least one of the hydraulic cylinders communicates between the front edge of the center frame member and the wing member hinge plate proximate to the front edge of the wing member, and further wherein at least one of the hydraulic cylinders communicates between the rear edge of the center frame member and the wing member hinge plate proximate to the rear edge of the wing member.
7. The agricultural implement of claim 6 further comprising a plurality of cylinder locks wherein each cylinder lock is configured to selectively lock the connected wing member in the first extended-working position or the second folded-transport position.

8. The agricultural implement of claim 1 further comprising at least one gauge wheel assembly, each gauge wheel assembly having a wheel and an adjustable linkage, at least one of the gauge wheel assemblies moveably attached to a wing member connected to the first of the side edges of the center frame member, wherein when the attached wing member is in the first extended-working position, the wheels of the gauge wheel assemblies are in contact with a field over which the agricultural implement is moving, and further wherein the adjustable linkages are configured to maintain a consistent vertical displacement of the connected wing member and the center frame member to the field.

9. The agricultural implement of claim 8 wherein at least one of the gauge wheel assemblies is moveably attached to the center frame member.

10. The agricultural implement of claim 1 further comprising:

a plurality of center frame member hinge plates mounted on the second of the side edges of the center frame member, wherein at least one of the center frame member hinge plates is proximate to the front edge of the center frame member, and further wherein, at least one of the center frame member hinge plates is proximate to the rear edge of the center frame member, so as to permit any of the wing members to be connected to the second of the side edges of the center member, and further wherein, once connected, the wing member is capable of being rotated between a first extended-working position substantially parallel to and outboard of the second of the side edges of the center frame member and a second folded-transport or storage position substantially above and perpendicular to the second of the side edges of the center frame member.

11. The agricultural implement of claim 10 wherein the plurality of center member hinge plates and the plurality of wing member hinge plates are configured so as to permit a connected wing member when in the second folded-transport or storage position to be substantially inboard of the second of the side edges of the center frame member.

12. The agricultural implement of claim 10 further comprising:

a hinge pin wherein each of the plurality of center frame member hinge plates and each of the plurality of wing member hinge plates is configured to receive the hinge pin, and further wherein the hinge pin traverses substantially the distance of the second of the side edges of the center frame member and connects each of the plurality of center frame member hinge plates and each of the plurality of wing member hinge plates mounted to the second of the side edges of the center frame member and to one of the side edges of the connected wing member, respectively.

13. The agricultural implement of claim 1 further comprising a plurality of plow beams moveably attached to the center frame member and to each of the plurality of wing members.

14. The agricultural implement of claim 13 further comprising a plurality of plowshares removeably attached to at least one of the plurality of plow beams.

15. The agricultural implement of claim 14 wherein the plowshares are configured to be vertically and angularly adjustable.

16. The agricultural implement of claim 1 wherein the front edge, the rear edge, and the two side edges of the center frame member define a planar center frame member opening, and further wherein the front edge, the rear edge, and the two side edges of each of the wing members define a planar wing member opening.

17. The agricultural implement of claim 16 further comprising:

at least one center frame member axle assembly rotateably attached to the side edges of the center frame member and spanning the center frame member opening; and

at least one wing member axle assembly rotateably attached to the side edges of the wing members and spanning the wing member openings.

18. The agricultural implement of claim 17 further comprising:

at least one cylindrical roller concentrically mounted on at least one of the center frame member axle assemblies; and

at least one cylindrical roller concentrically mounted on at least one of the wing member axle assemblies.

19. The agricultural implement of claim 18 further comprising:

at least one seeder bin, wherein the seeder bins are selectively mounted above the cylindrical rollers; and

a plurality of feeder tubes connected to the seeder bins, wherein the feeder tubes are configured to be vertically and angularly adjustable.

20. The agricultural implement of claim 18 further comprising at least one scraper plate moveably attached to the agricultural implement, the scraper plates positioned in proximity to the cylindrical rollers so as to continually dislodge accumulations of soil from the cylindrical rollers as the cylindrical rollers rotate.

21. The agricultural implement of claim 20 wherein the scraper plates extend the entire length of all cylindrical rollers; and further wherein each scraper plate is constructed from flat metal of at least 0.64 centimeters (0.25 inches) by 10.16 centimeters (4.0 inches) with a hardened steel wear strip of at least 1.27 centimeters (0.5 inches) by 3.81 (1.5 inches) connected to the bottom of the flat metal.

22. The agricultural implement of claim 1 further comprising:

at least one seeder bin; and

a plurality of feeder tubes connected to the seeder bins, wherein the feeder tubes are configured to be vertically and angularly adjustable.